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Ridgway's Vertical Revolving Battery - 1865

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REPORT

OF THE

JUDGES ON NEW INVENTIONS AND MACHINES, AT THE TENTH EXHIBITION OF THE

MASSACHUSETTS

CHARITABLE MECHANIC ASSOCIATION,

ON

JOHN RIDGWAY'S

Vertical Revolving Battery,

AWARDING A GOLD MEDAL.

Board of Judges:

J. C. HOADLEY.
N. HENRY CRAFTS.
L. A. CUTLER.
EDWIN REYNOLDS.
C. E. RYMES.
LOUIS OSBORN.
JAMES B. FRANCIS.
LOUIS D. BARTLETT.
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RIDGWAY'S BATTERY.

THIS invention is deemed to be of sufficient importance to call for particular and extended notice.

Recent experience has taught us that no inventions are more important than those relating to the art of war. To the original "Monitor" we owe our deliverance from the danger of a crushing disaster, which might have reversed the issue of the war, and darkened the course of history. The service rendered by subsequent vessels of her class, though not so striking, were of incalculable value. To the efficiency of our repeating arms do we owe many a victory. It is not too much to say, that the ingenuity and skill of our mechanics have proved as important and necessary as the courage and devotion of our soldiers, to the salvation of our country.

In the event of a foreign war, the same would hold good in, perhaps, a greater degree. Fought, as such a war must be, chiefly upon the ocean, that nation which should have at command the best results of mechanical science and skill, would certainly come out best from the encounter. Those ships which unite in the highest degree the qualities of invulnera-

bility, speed, manageability, with weight and velocity of projectile, safety and accuracy of gun, and convenience of manipulation under all circumstances, will give the nation which is wise enough to invent and fortunate enough to possess them, victory, security, and glory in future maritime wars.

It is to the last mentioned of the above qualities that the invention of Mr. RIDGWAY relates. Although last mentioned, it is not only of the highest importance, but really among the first things in the order of time to be determined, since upon the manner of mounting and manipulating its guns, will the whole structure of the ship, in a great measure, depend.

Mr. RIDGWAY proposes to mount the guns in a vertical wheel, revolving on a horizontal axis, which axis is supported by a horizontal table, to which a horizontal rotatory motion is imparted, so that the gun may be freely moved in all directions.

Two guns are placed on opposite sides of the wheel, so as to counterbalance each other, and to admit of alternate firing, whereby they may be kept from too rapid heating. The axis of each gun being upon a chord of an arc of the central periphery of the wheel, the axis of the wheel is placed at such distance below the deck as to bring the gun at a suitable height above the deck to admit of any required depression of aim.

When, therefore, one gun is in position for firing, or "in battery," the other gun must be quite low

down in the hold, as the bottom of the wheel is placed near the top of the kelson; and, as the axis of the wheel is below the deck, and probably in all cases below the surface of the water, great stability must result. The periphery of the wheel is formed into the zone of a sphere of radius equal to its own central radius, and that portion of this zone projecting above the deck is supplemented on each side by the segment of a sphere of corresponding radius, so that the whole arrangement, as seen above the deck, presents the appearance of a spherical dome of small elevation. This entire dome has the horizontal rotatory movement before spoken of, and its central zone, which is the segment of the wheel for the time uppermost, has also a free rotatory movement in a vertical plane, on the horizontal axis of the wheel. All these movements are secured by mechanism of the simplest kind, and the movements themselves, being merely rotatory, are the simplest and least liable to derangement of any known to mechanics.

All parts being perfectly balanced, the power required is merely that necessary to overcome the friction of well-made and well-oiled surfaces, so situated as to be perfectly protected from dirt or injury; and the power of steam is conveniently applied to effect all required movements.

The cleaning and loading of the gun are done when it is in its lower position, low down in the hold, where it is rendered perfectly secure by the water. The

arrangements for loading, aiming, and firing, seem to be simple and convenient; but these are susceptible of a great variety of modifications, should such be dictated by experience, for the convenience of officers and men. No port-hole is required but the muzzle of the gun itself; and for this, no port-stopper is necessary; the recoil of the gun instantly elevates the muzzle out of the reach of hostile shot.

No costly and troublesome arrangement of springs is necessary to receive the recoil, since this is provided for in the simplest and most efficient manner, by the rotation of the wheel, which must be favorable to the durability and safety of the gun.

No smoke is admitted to the casemate, save that from the vent. Only an officer, or at most an officer and one man, can be required in the upper portion of the turret, where the gun is trained, sighted, and fired; the rest being in the lower portion, away from noise and smoke, and perfectly protected by the water.

There is no limit to the elevation of the gun, from any suitable depression below the horizontal to the zenith. Every gun, therefore, may be used as a mortar, for vertical fire.

It is obvious that this arrangement admits of the smallest exposed area of turret, or casemate, — much smaller than the Ericsson turret, — and that greater thickness of armature at this point is, therefore, attainable with a given weight. At the same time the

spherical form is in itself the strongest possible against blows from without, so that equal thickness would give greater security than in the cylindrical turret,

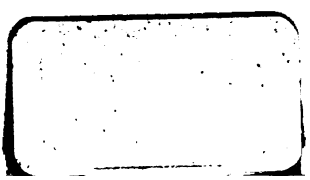
If it be objected that the lobes each side of the wheel are liable to displacement, so as to be in danger of binding against the wheel, interfering with its free rotation, this danger may be entirely removed by various simple devices. An effective method would be, to place the pilot-house on the top of the dome, thus strongly uniting the lobes at their summit. This would be attended by the loss of the power to elevate the gun above forty-five degrees perhaps, and other methods might be preferable. A suitable chamfer on the angles of the wheel and lobes, would perfectly guarantee the joint against injuries that cause the wheel to bind so as to prevent its free revolution. Provision is also contemplated to be made to remove the lobes to a slightly increased distance from the wheel, so as to relieve the latter, if obstructed by any cause, at the joint between it and the lobes of the turret. This may be done even during action.

It may be thought presumptous by the brave, experienced, and accomplished officers of our navy, on the part of mechanics and artisans unskilled in the art of war, if they express too confidently their opinions upon untried devices in the application of mechanical science to warlike purposes. But the adaptation of means to ends, is in this case so perfect, the means

themselves are so simple and efficient, and the ends are so important that we cannot refrain from urging this invention most earnestly upon the attention of our Government. The strong and hearty approval which it has received from our ablest and most experienced naval officers fully sustains our opinion of its merits.

Skilfully carried out in all its details, mounted in such a hull as our shipwrights can build, propelled by such engines as our machine-shops can turn out, provided with the guns which experience has shown to be most efficient, or with those better guns which improved methods of working steel will certainly give us, commanded by such men as Farragut and Winslow and Porter, and manned by such tars as those who fought their way past Forts Jackson and St. Philip, and into the Bay of Mobile, this Ridgway Battery would, in the opinion of this Committee, give us signal advantages over all the navies of the world. We award to JOHN RIDGWAY, of Boston, for his Revolving-gun Battery, the highest testimonial we can bestow — a

GOLD MEDAL.



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